

**Draft Stanislaus *O. mykiss* Objectives**  
**August 12, 2014**

**NMFS Steelhead Recovery Goals**

Minimum adult escapement of 2,500 over three years, with a minimum effective population size of 500 (census size of standing stock- for every 1 fish returning 2 fish remain in ocean) (850 escapement in one year). This would be measured as a minimum three-year running average of 850 adult steelhead (not counting half-pounders), with a minimum effective population size\* of 500 in any given year.

**OBJECTIVE #1: LIFE-HISTORY (ANADROMY/RESIDENCY)**

Goal: Support the fullest expression of *O. mykiss* life-history diversity in order to increase population stability, resiliency, and productivity. Currently, the SJ tributaries are dominated by resident forms, and need to express more anadromy to meet NMFS recovery goals.

A. Anadromy: the proportion of age-0 fish that eventually smolt vs. remain residents should be a minimum of \_\_\_\_ by \_\_\_\_

Rationale: Age-0 fish have not yet selected a life-history pathway (anadromy or residency). Tracking the proportion that eventually smolt is a measure of the life-history diversity of the *O. mykiss* population.

B. The proportion of all counted adult *O. mykiss* over a full year shall be a minimum of \_\_\_\_resident (> x FL) and \_\_\_\_anadromous (> y FL) individuals

Rationale: This objective is also an attempt to improve life-history diversity of the population, but measures it from the perspective of adult *O. mykiss*.

C. Maintain a minimum resident adult (FL > \_\_\_\_ ) population number of \_\_\_\_ individuals per square meter or per linear distance (not %)\*\*

Rationale: This objectives seeks to maintain a minimum number of adult residents to allow the continuation of the popular sport fishery, as well as creating a “refuge population” of *O. mykiss* in the river that can give rise to anadromous progeny.

## OBJECTIVE #2: JUVENILE PRODUCTIVITY

A. The density of age-0 *O. mykiss* shall be \_\_\_\_ individuals per square meter or per linear distance by year \_\_\_\_ in specified reaches.

Rationale: To achieve desired smolt production levels, a minimum number of YOY need to be produced. This objective could be measured through snorkel surveys, efishing, or other appropriate sampling techniques.

B. The growth rates of individuals shall increase over time (e.g., can we put in the difference in growth rates of Mokelumne River vs. American River fish to have some expectation of mm increase?) ... as measured by the size at age of age-0 and age-1 juveniles. An average of Xmm shall increase over time to an average of \_\_\_\_ mm FL by \_\_\_\_ month. An exception to this requirement shall be at YOY and age-1 densities over \_\_\_\_ and \_\_\_\_, to allow for lower growth rates at high juvenile densities.

Rationale: Faster growing juveniles should produce larger, younger smolts, which are known to have higher survival to the adult stage.

C. The number of smolts produced shall increase over time to an average of \_\_\_\_ by year \_\_\_\_.

Rationale: Even at good smolt to adult return rates, a minimum number of smolts is needed to achieve the adult abundance goal.

## OBJECTIVE #3: ADULT SPAWNING

A. When steelhead are present, eggs will have an egg-emergence survival rate of \_\_\_\_% (measured by surrogates and/or as projected by monitoring of temperature, flow, and scour)

Rationale: Stream conditions should be suitable for successful spawning and rearing of eggs and alevins.

### Notes on Measurement:

Can do some egg survival studies (implant eggs and measure survival in time and space)?

Monitor redd construction, temperatures, and flows

#### OBJECTIVE # 4 –JUVENILE SURVIVAL (AS A PROXY FOR POPULATION PRODUCTIVITY)

Goal: Attain steelhead productivity (survival rates) necessary in order to attain (a) “doubling” rate of population growth (b) resilience to low populations (re-attainment of abundance targets following years of poor recruitment) and (c) survival/CRR rates “typical” of this life-history type.

Apply survival rates (productivity objective) using same methodology as calculated for fall run Chinook. Set needed number of smolts to reach 850 adults (assuming a smolt to maiden spawner survival based on BDCP objectives?).

\_\_\_% of silvery parr and smolts (stage 4 and 5 O. mykiss) counted at (lower end of gravel bedded reach) must be detected at (survive to) Mossdale.

#### Rationale:

Apply same survival methodology to steelhead escapement as we applied to fall run escapement, but with a goal of 850 adults.